



Mars Exploration Rover Project Science Overview

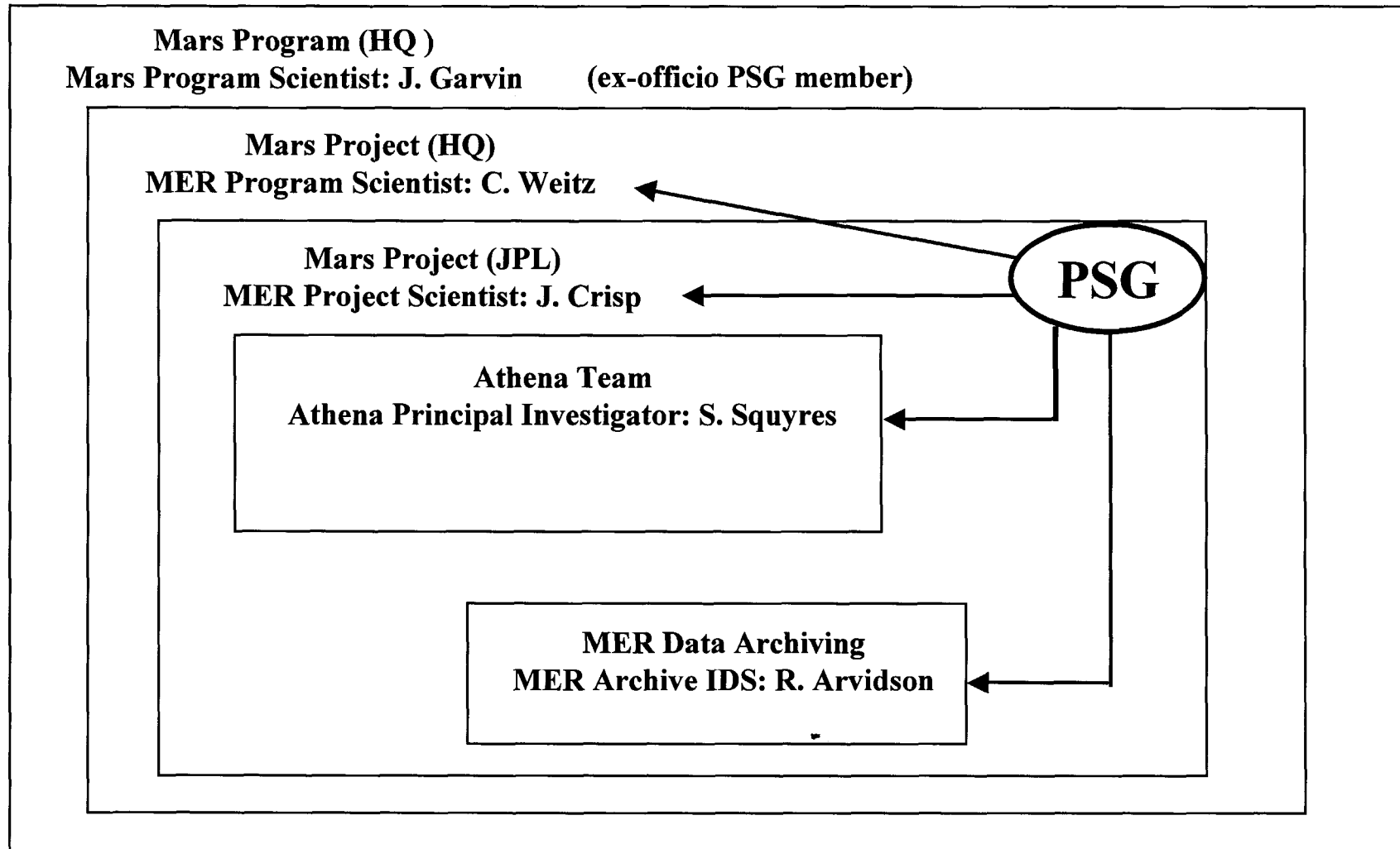
**Joy Crisp
MER Project Scientist
June 17, 2002**



- Athena Team Meetings and MER Project Science Group Meetings are combined
- Usually 2-3 days duration
- Recently scaled back to 3 meetings per year:
2 @ JPL, 1 @ Cornell.
Next one is at Cornell, Oct. 16-18, 2002.



Lead scientists' roles in maximizing the MER science return, within their constraints





Project Science Group (PSG)



PSG advises the Project Manager

PSG optimizes mission science return and resolves conflicting science requirements, within the trade-space of the Project and Program

PSG Working Groups:

- Science Operations Working Group (Chaired by S. Squyres)

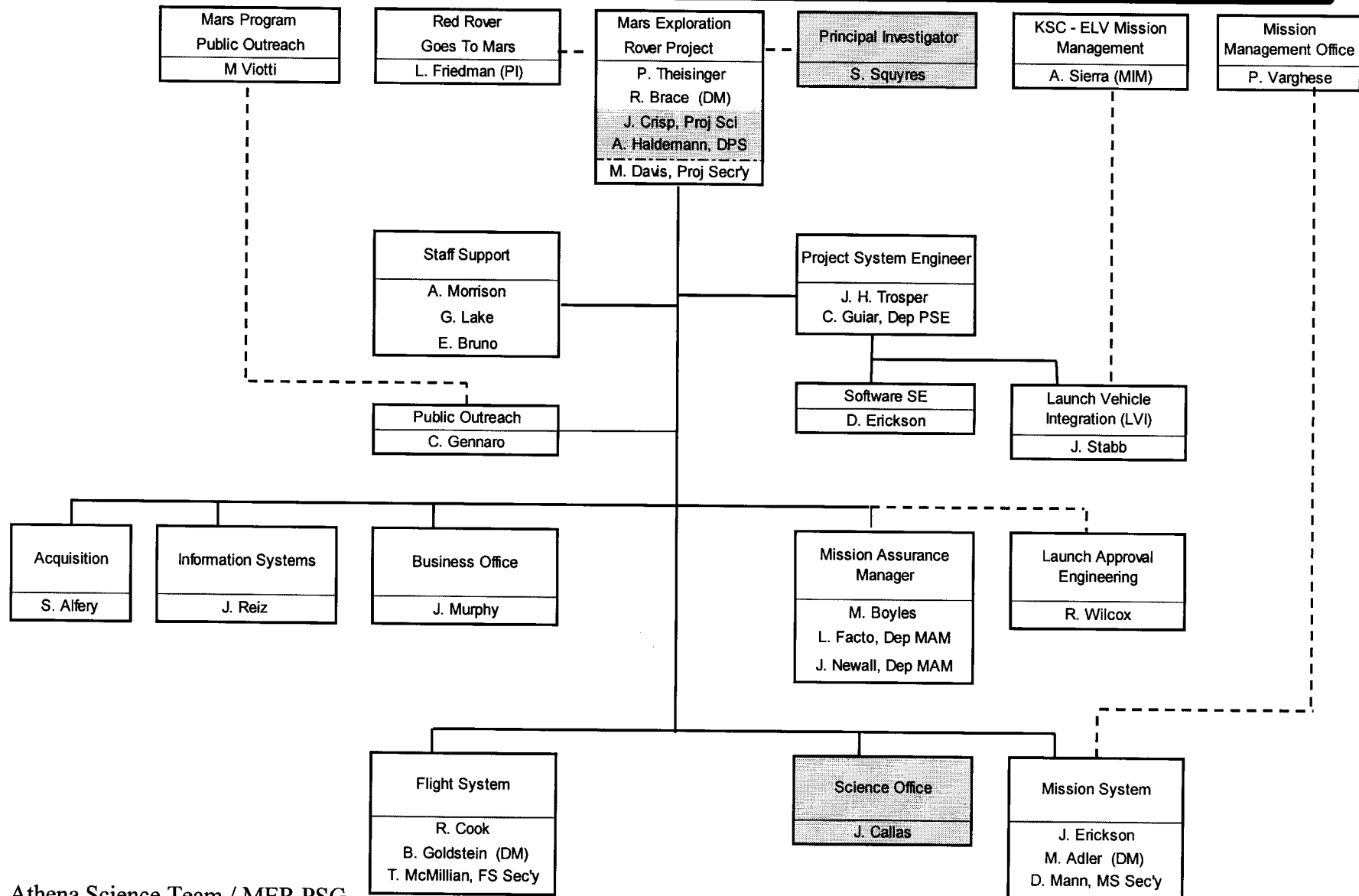
 - Develops detailed science observation objectives and science plans for operations

- Data Archive Working Group (Chaired by R. Arvidson)

 - Plans the detailed schedule and Planetary Data System deliverables



MER Project Organization

JPL



Project Scientist Role/Responsibilities



Responsible to the Project Manager for maximizing the science return from the mission, within Project constraints

Make scientific judgements for the Project, act as a scientific advisor to the Project Manager

Concur in all engineering decisions affecting mission success and integrity of the scientific investigations

With the Science Manager, see that the scientists are properly supported and carry out their responsibilities

See that other elements of the Project carry out their responsibilities in support of the science aspects of the mission

Serve as a scientific spokesperson for the Project

Assist in development and monitoring interfaces between the science team and Project, to assure effective working relationships

Inform the MER Program Scientist of any changes in objectives, techniques, or allocation of resources for investigations



Deputy Project Scientist



Albert Haldemann

Supports me in carrying out those responsibilities

Attends key Project meetings that I can't attend

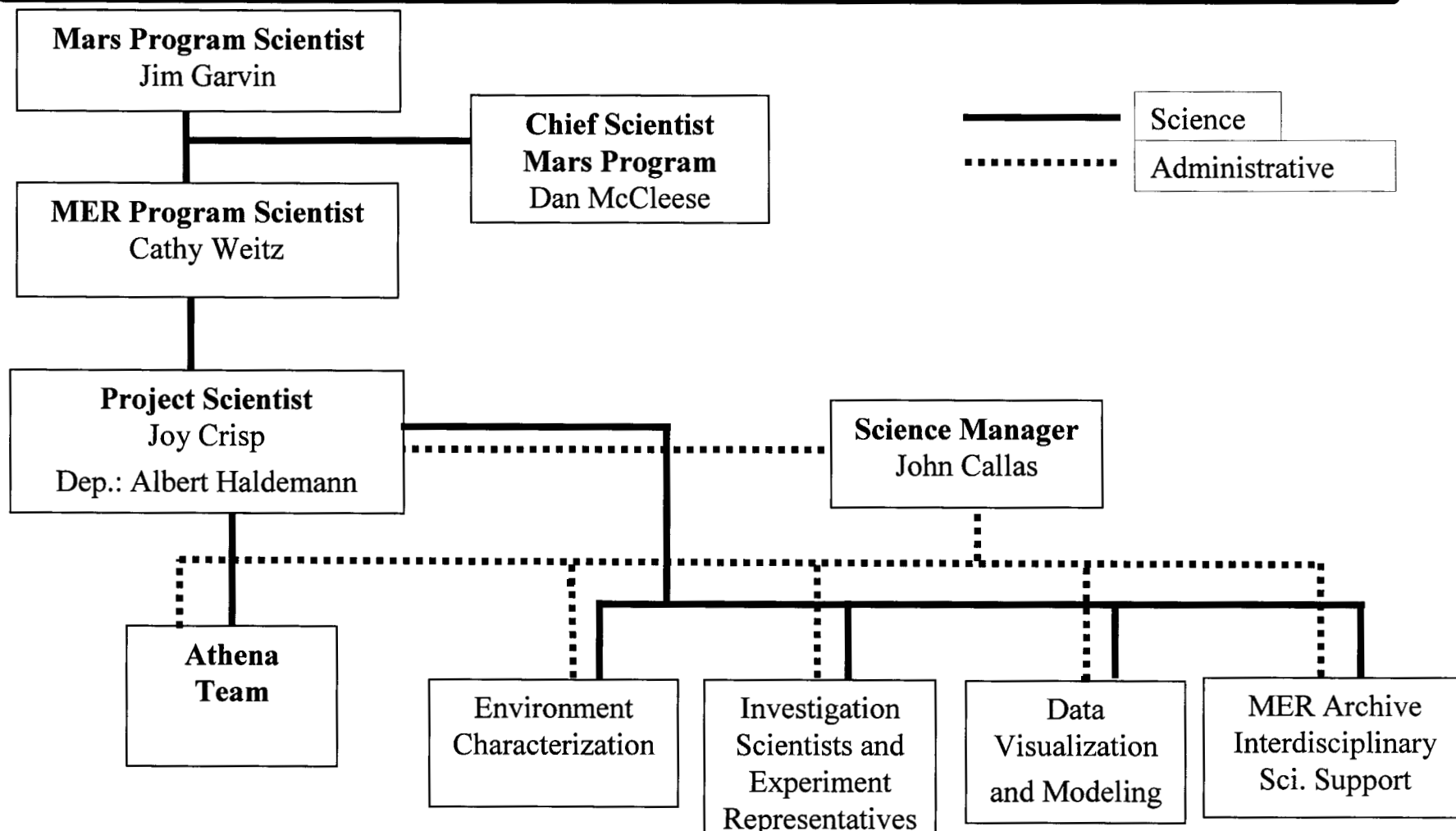
Acts on behalf of me, when I'm absent

Focus on operations, operations testing, ATLO verification
and validation, and support for environmental
characterization (radar roughness)





MER Science Management: Development Phase





Investigation Scientists and Experiment Representatives



- **Bob Anderson** (IDD, Rock Abrasion Tool, Soil Properties)
- **Diana Blaney** (Mini-TES)
- **Justin Maki** (Imaging: Pancam, Microscopic Imager, Hazcam, & Navcam)
- **Albert Yen** (Mössbauer, APXS, Magnets)
- **Deborah Bass** (Team Lead Science Operations Support Team)
- **Charles Budney** (Mission Operations Experiment Rep., Operability, Sequencing)



Bob



Diana



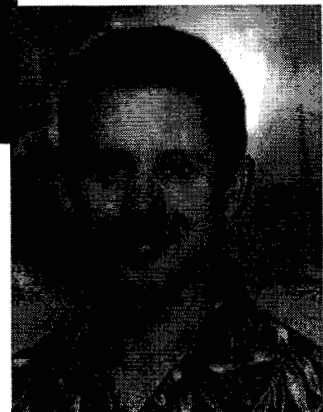
Justin



Albert



Deborah



Charles



Investigation Scientists and Experiment Representatives



- Science liaison between the Project and the Athena Science Team, reporting issues to Athena PI and Project Scientist.
- Help with the development of data analysis strategies, data downlink telemetry displays, operational tests, and training.
- Provide science clarification of instrument requirements and issues to the engineers. Explain engineering constraints and issues to the Athena PI and and Project Scientist.
- Assist with calibration.
- Evaluate designs, operational plans, and trade studies, and alert the Athena PI, Project Scientist to issues affecting science return, offering suggestions for improvements.
- Support data processing and archiving, and science outreach

These folks become Payload Downlink & Uplink Leads during Operations, and will also participate in the Science Theme Groups

They will provide much of your training on Ground Data System Software



Mars Environment Characterization



Science Office Support:

Matt Golombek (surface)

(with support from F. Scott Anderson and Nathan Bridges)

Tim Parker (surface)

David Kass (atmosphere)

John T. (Tim) Schofield (atmosphere)

Additional science support provided by Mission Assurance:

Terry Z. Martin (dust, atmosphere)

JPL and outside experts are also contacted regularly to track down answers to engineers' questions.



MER Docushare Electronic Library



- ◆ There are now 41 Gbytes of files in this library!
- ◆ Can be accessed by approved Athena Team Members who are U.S. citizens or “Green Card” holders
 - contract must be initiated (unless you’re a JPLer)
 - approx. 1 week for JPL badging and remote computer access
 - approx. 2 weeks for VPN “Virtual Private Network” account setup
- ◆ ITAR regulations do not permit us to allow access to Docushare by foreign nationals. The Athena Team Members and their approved collaborators are covered by approved Letters of Agreement approved by NASA and their foreign agencies.
- ◆ We can send “interface information” to the foreign Athena Team Members who



- We can send technical “interface information” (things they need to know to carry out what’s described in their proposed investigation or Letter of Agreement) to the foreign Athena Team Members, as long as we add the proper disclaimer and log the exchange of information in the JPL ITAR data base.



Key MER Project Documents



- ◆ **Mission Plan**
- ◆ **Level 1 and 2 Project Requirements**
- **Functional Design Descriptions** (especially autonomous navigation, mobility, communications, IDD, rock abrasion tool, APXS & MB, PMA, Mini-TES, Imaging, Surface Behaviors)
- ◆ **Flight–Mission Interface Control Document** (Flight & Mission Rules, Sequencing Baseline, Uplink and Downlink Volumes, Command Dictionary)
- ◆ **Mission System Critical Design Review, Dec. 2001**
- ◆ **Experiment Data Record Software Interface Specifications** (EDR SIS)



Key MER Science Documents



- ◆ MER Science Management Plan
- ◆ Athena Science Implementation Plan
- ◆ Athena “Rules of the Road”
- ◆ Mars Exploration Program Data Management Plan
- ◆ MER Archive Generation, Validation, and Transfer Plan
- ◆ MER Science Requirements Document



Monthly Newsletter



- Monthly MER Science Newsletter for the teams involved in the MER Project started January, 2001.
- The hyperlinks in the Document link mostly to files in MER Docushare
- Inputs for upcoming newsletters are welcome!
 - New discoveries, new developments, new plans, payload status updates, interesting bits of information of use to the team, etc.



MER Meetings of Science Interest List

indicates the day, time, telecon phone number, person to contact to be added to the mailing list (some meetings generate agendas and minutes), and Docushare location.

The meetings that will probably be of highest interest:

- Science Operations Working Group (SOWG)**
- Data Archive Working Group (DAWG)**
- Imaging Working Group**



Media Interactions



MARY HARDIN (Mary.Hardin@jpl.nasa.gov, 818-354-0344) is our JPL Media Relations representative for MER. If you are contacted by the media at a level higher than your hometown paper/local news, let her know about it. (Also, if you'd like to check on the reporter before an interview, you can call her and ask if she has any background information).

ALL news releases related to this mission must be reviewed by JPL Media Relations and NASA HQ prior to release

All public Web sites related to this mission must be reviewed by JPL Media Relations

Any JPL visits by the press must be cleared by JPL Media Relations

In public references, refer to the rovers as "Rover A" and "Rover B" at least until they have real names (rather than MER-A and MER-B). The project should be referred to as the "Mars Exploration Rover Mission" or "the rovers" or "the mission" (rather than MER).



MER Risk Communication Issues



- **The MER spacecraft will each have Radioactive Heater Units (RHUs) and curium and cobalt instrument sources**
- **The risk from a launch accident is higher than Pathfinder**
- **Unsure what level of concern there will be regarding the nuclear risk**
- **Plans are being made for a number risk communication activities, proactive and reactive**
- **Following risk communication guidelines is very important**



MER Risk Communication Guidelines



- **Until the MER Environmental Impact Statement is finalized, use of nuclear materials is ‘potential’**
- **Refer all questions on the nuclear risk to Pete Theisinger or Richard Brace. Media inquiries go to Mary Hardin**
- **What you can say:**
 - **Safety is NASA’s first priority**
 - **The nuclear safety aspects of the mission will be discussed in the EIS (which is available) and will be reviewed at the highest levels of government**
- **For more information, email:**
sandra.m.dawson@jpl.nasa.gov



JGR Near-Term Publication Plans



I am trying to organize a special issue of JGR-Planets on the Mars Exploration Rover Mission and its candidate landing sites. I don't have confirmation from AGU on this yet.

The issue would be comprised of 2 parts (same format as the Mars Pathfinder Feb. 1997 issue):

- (1) A series of invited papers describing the Mars Exploration Rover Mission and science instruments.
- (2) Contributed papers from the science community on any aspect of the candidate landing sites.

Papers would be due December 2, 2002, for publication December, 2003, before landing.



Issues currently getting top science attention



- Preparation for a month-long July test of operations processes & procedures for an “Approach Sol”
- Data Product Tracking has been on “back burner” for months...may be difficult to add
- Bracing ourselves for a lot of work: Camera calibration, operations planning, training, and testing....